Introduction to 4GL Development Environment

Part : 1

Duration : 06hrs

Detailed Syllabus

8.1 Overview of GUI design; Designing menus, screens and reports; data validation in data entry screens.

8.2 Creating Databases and Tables; Creating and using Forms, Queries and Reports.

8.3 Exercises

   8.3.1 Creation and manipulation of relational databases.

   8.3.2 Reference to a Case study, involving database design,   analysis and implementation.

Standard-alone and embedded query languages

SQL is mostly used as a standard-alone (Interactive) query language to manipulate data of a database.

However programs written in some host language such as C could include SQL code through Embedded SQL.

Embedded SQL allows programmers to connect to a database and include SQL code right in the program, so that their programs can use, manipulate, and process data from a database

Database Trigger

- A **database trigger** is procedural code that is automatically executed in response to certain events on a particular table in a database. Triggers can restrict access to specific data, perform logging, or audit data modifications.

- There are two classes of triggers, they are either "row triggers" or "statement triggers". With row triggers you can define an action for every row of a table, while statement triggers occur only once per INSERT, UPDATE, or DELETE statement.

Stored Procedure

- A **stored procedure** is a subroutine available to applications accessing a relational database system. Stored procedures are actually stored in the database.

- Typical uses for stored procedures include data validation (integrated into the database) or access control mechanisms. Furthermore, stored procedures are used to consolidate and centralize logic that was originally implemented in applications. Large or complex processing that might require the execution of several SQL statements is moved into stored procedures and all applications call the procedures only.

A **fourth-generation programming language**(**1970s-1990**) (abbreviated **4GL**) is a programming language or programming environment designed with a specific purpose in mind, such as the development of commercial business software.

All 4GLs are designed to reduce programming effort, the time it takes to develop software, and the cost of software development.

4GL tools provide Rapid Application Development environment for industrial strength applications thus applications on top of DBMS could be built with less effort.

Some components of a 4GL tool contains,
- Forms,
- Screen Code Generator,
- logic
- Report Code Generator,
- Menu System, and
- Front-end GUI Generator:

Forms

- 4GL Forms allow you to design and construct your complicated screens using a drawing board. It lets you define labels and fields both user defined and database table driven elements.

- This nifty tool allows you to define lookups to data fields on the form and create hooks to multiple screens via zooms.

- This tool uses user-friendly dialog box-oriented-interface that should make life of developers' easier. Even complicated screens such as header-detail can be created with little effort. Types of screens include query, browse, add-on, zoom and extension, etc.

Logic

- 4GL Logic allows you to seamlessly integrate the generated code with the customized code that you write in simple instructions.

- It keeps your generated logic intact thus making it easier to embed business logic via the hooks, dynamically without having to re-generate the form or the code.

Screen Code Generator

- 4GL Screen Code Generator uses your forms as the source of information to produce source code with all the logic for robust user input programs.

- The Code Generator also provides hooks in the form of tags, which later can be used to modify or edit your code as and when required.

Report Generator

- Report generators take a description of the data format and the report to generate and from that they either generate the required report directly or they generate a program to generate the report.

Report Code Generator

- 4GL Report Code Generator produces complete 4GL code for structured, diagrammed report generation.

- Generated code is completely commented and modifiable by design. The resulting 4GL report program is extremely flexible. When it is run, the use of program flags allows you to change how the report program is used.

- It would allow to redirect the output to an email ID, a fax machine, a system file, screen, or to a printer.

- Would allow to define an user input form to capture filters for "Ad hoc" selection of data set at the time of printing and produce the report output dynamically.

- All generated reports can be viewed in a browser and sent via email.

4GL Menus

- 4GL Menus let you develop and create a menu'ing interface with a few keystrokes that offer better "look and feel" and program/system organization capabilities than any similar product.

- The GUI menu gives you a windows explorer like look and feel.

GUI Front-end Generator

- The GUI **(graphical user interface)** generator can connect to a chosen host and automatically create GUI front-end executables that will run on chosen machines.

- Here the Code Generator builds the code for both character and GUI at the back-end, so that no additional coding is required.

- The users still have a choice between using GUI or character windows through the same front-end.

- Such a feature would enable a business to give GUI access to certain users and character based access to others.